

Claims

We claim:

1. An NPN transistor formed in a semiconductor substrate, said substrate being doped with P-type impurity and not comprising an epitaxial layer, said transistor
5 comprising:

an N-type isolation region extending downward from a surface of said substrate, said N-type isolation region comprising a deep N layer and an annular N well, said N-type isolation region enclosing an isolated P region of said P-type substrate, said N-type isolation region also forming a collector of said transistor, said isolated P region forming
10 a base of said transistor;

wherein said N well comprises a retrograde doping profile;

an N-type region located at said surface of said substrate within said isolated P region, said N-type region forming an emitter of said transistor;

a shallow P-type region within said isolated P region to facilitate electrical contact
15 to said base of said transistor, said shallow P-type region having a doping concentration higher than said substrate, and

electrical contacts to said emitter, said base and said collector in order to facilitate electrical biasing of said NPN transistor.